

CLAIMS

WE CLAIM:

1. A motor controller system comprising:
  - 2 power switches for connection to an AC line for controlling application of AC
  - power to the motor;
  - 4 a fault contactor having contacts;
  - a motor wiring circuit for operatively connecting the power switches and fault
  - 6 contactor contacts with motor winding terminals;
  - voltage sensors for sensing AC line voltage and motor winding terminal voltage;
  - 8 and
  - a control circuit for controlling operation of the switches and the fault contactor,
  - including de-energizing the fault contactor in an off mode where AC line power is not supplied
  - to the motor winding terminals, the control circuit measuring AC line voltage and motor winding
  - terminal voltage in the off mode and detecting an error condition responsive to sensed AC line
  - voltage being substantially different from motor winding terminal voltage in the off mode.
2. The motor controller system of claim 1 wherein the voltage sensors sense
- 2 AC line to neutral voltage and motor winding terminal to neutral voltage.

3. The motor controller system of claim 1 wherein the voltage sensors sense  
2 voltage for each winding of the motor and each phase of the AC line.

4. The motor controller system of claim 1 wherein the motor wiring circuit  
2 electrically connects the power switches and fault contactor contacts in a delta configuration with  
the motor windings.

5. The motor controller system of claim 4 wherein the control circuit detects  
2 an error condition responsive to sensed AC line voltage having a different phase relationship  
from motor winding terminal voltage in the off mode.

6. The motor controller system of claim 1 wherein the motor wiring circuit  
2 electrically connects the power switches and fault contactor contacts in line with the motor  
windings.

7. The motor controller system of claim 6 wherein the control circuit detects  
2 an error condition responsive to sensed AC line voltage having a substantially different voltage  
level from motor winding terminal voltage level in the off mode.

8. A motor starter system comprising:

2 solid state switches for connection to an AC line for controlling application of AC  
power to the motor;

4 a fault contactor having contacts;

a motor wiring circuit for operatively connecting the solid state switches and fault  
6 contactor contacts with motor winding terminals;

a voltage sensor for sensing AC line voltage and motor terminal voltage; and

8 a control circuit for controlling operation of the solid state switches and the fault  
contactor, including de-energizing the fault contactor in an off mode where AC line power is not  
10 supplied to the motor winding terminals, the control circuit detecting AC line voltage and motor  
terminal voltage in the off mode and detecting an error condition responsive to sensed AC line  
12 voltage being substantially different from motor terminal voltage in the off mode.

9. The motor starter system of claim 8 wherein the voltage sensors sense AC

2 line to neutral voltage and motor terminal to neutral voltage.

10. The motor starter system of claim 8 wherein the voltage sensors sense

2 voltage for each winding of the motor and each phase of the AC line.

11. The motor starter system of claim 8 wherein the motor wiring circuit  
2 electrically connects the solid state switches and fault contactor contacts in a delta configuration  
with the motor windings.

12. The motor starter system of claim 11 wherein the control circuit detects an  
2 error condition responsive to sensed AC line voltage having a different phase relationship from  
motor terminal voltage in the off mode.

13. The motor starter system of claim 8 wherein the motor wiring circuit  
2 electrically connects the solid state switches and fault contactor contacts in line with the motor  
windings.

14. The motor starter system of claim 13 wherein the control circuit detects an  
2 error condition responsive to sensed AC line voltage having a substantially different voltage level  
from motor terminal voltage level in the off mode.

15. A method of fault contactor detection prior to motor starting comprising:

2 providing solid state switches for connection to an AC line for controlling  
application of AC power to the motor;

4 providing a fault contactor having contacts;  
electrically connecting the solid state switches and fault contactor contacts with

6 motor winding terminals;  
sensing motor AC line to neutral voltage and motor terminal to neutral voltage;

8 controlling operation of the solid state switches and the fault contactor prior to  
motor starting , including de-energizing the fault contactor in an off mode where AC line power

10 is not supplied to the motor winding terminals, detecting AC line voltage and motor terminal  
voltage in the off mode and detecting an error condition responsive to sensed AC line voltage

12 being substantially different from motor terminal voltage in the off mode.

16. The method of claim 15 wherein electrically connecting the solid state

2 switches and fault contactor contacts with motor winding terminals comprises electrically  
connecting the solid state switches and fault contactor contacts in a delta configuration with the

4 motor windings.

17. The method of claim 16 wherein detecting an error condition responsive to

2 sensed AC line voltage being substantially different from motor terminal voltage in the off mode

comprises detecting an error condition responsive to sensed AC line voltage having a different  
4 phase relationship from motor terminal voltage in the off mode..

18. The method of claim 15 wherein electrically connecting the solid state  
2 switches and fault contactor contacts with motor winding terminals comprises electrically  
connecting the solid state switches and fault contactor contacts in line with the motor windings.

19. The method of claim 18 wherein detecting an error condition responsive to  
2 sensed AC line voltage being substantially different from motor terminal voltage in the off mode  
comprises detecting an error condition responsive to sensed AC line voltage having a  
4 substantially different voltage level from motor terminal voltage level in the off mode..